

What is claimed is:

1. A charged-particle beam irradiator for allowing a scan electromagnet provided on an entrance side of a final deflection electromagnet to scan a charged-particle beam to expand an irradiation field, said charged-particle beam irradiator, comprising:

a plurality of said scan electromagnets, wherein
kicks provided by the plurality of said scan electromagnets are superimposed to form a collimated irradiation field at an exit of said final deflection electromagnet.

2. A charged-particle beam irradiator according to claim 1, wherein said plurality of scan electromagnets are arranged according to following equation.

$$a_{11}(s_1) \cdot X_1' + a_{11}(s_2) \cdot X_2' + \dots + a_{11}(s_n) \cdot X_n' = 0$$

where,
n: number of the electromagnets.
 $s_1 \dots s_n$: distance from each electromagnet to
beam irradiated position
 $a_{11}(s)$: coefficient of beam transport matrix
 X' : beam divergence at the beam irradiated
position

3. A charged-particle beam irradiator according to claim 1 or 2, wherein said plurality of scan electromagnets are interposed between said final deflection electromagnet and a deflection electromagnet disposed on an entrance thereof.

4. A charged-particle beam irradiator according to claim 3, wherein said plurality of scan electromagnets are disposed

Your Ref.: 107292-00023
Our Ref. : SPF052US

upstream from said deflection electromagnet at an entrance thereof.

5. A charged-particle beam irradiator according to claim 1 or 2, wherein said plurality of scan electromagnets are disposed independent of each other in X and Y directions.

6. A therapy system, comprising:

a charged-particle beam irradiator, having a plurality of scan electromagnets, configured such that kicks provided by the plurality of said scan electromagnets are superimposed to form a collimated irradiation field at an exit of a final deflection electromagnet to irradiate an affected part with a charged-particle beam.